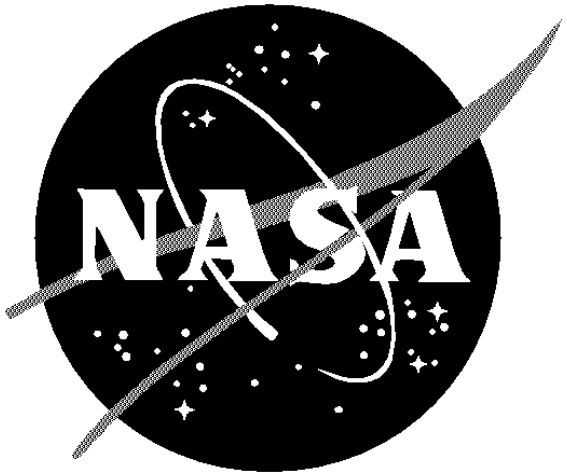

National Aeronautics and Space Administration

February 3, 1997

NRA-97-MTPE-01

RESEARCH ANNOUNCEMENT

Satellite Remote Sensing Studies of Biological and Biogeochemical Processes in the Ocean

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Letters of Intent Due March 5, 1997
Proposals Due April 4, 1997

OMB Approval No. 2700-0087

Satellite Remote Sensing Studies of Biological and Biogeochemical Processes in the Ocean

NASA Research Announcement

Soliciting Research Proposals

for

Period Ending

April 4, 1997

NRA 97-MTPE-01
Issued February 3, 1997

Office of Mission to Planet Earth
National Aeronautics and Space Administration
Washington, DC 20546

1.0 Purpose

NASA's Mission to Planet Earth (MTPE) solicits proposals for remote sensing research related to biological oceanography and ocean biogeochemistry as described in NASA's Mission to Planet Earth Science Research Plan (September, 1996). The focus of this NRA is on research emphasizing satellite ocean color scanner imagery as the principal data source, although studies of ocean biological and biogeochemical processes using satellite sensors other than ocean color scanners as the principal tool will also be considered. Incorporating *in situ* and other satellite data in the investigation is also encouraged as is assimilation of satellite data into mathematical models. This announcement also provides a mechanism for US and foreign investigators to apply for membership in a new, reformed Sea Wide Field Sensor (SeaWiFS) Science Team.

The total amount of funds is approximately $4.5 million per year for three years.

2.0 Background

NASA, NASDA (National Space Development Agency, *Japan*) and other space agencies have recently launched, or will launch, a suite of satellite sensors to measure ocean color, ocean winds, sea surface temperature (SST), ocean topography and other properties of the sea surface (e.g. with Synthetic Aperture Radar). Satellite ocean color scanners now operating include POLDER (Polarization and Directionality of the Earth's Reflectances), MOS (Modular Optoelectronic Scanner) and OCTS (Ocean Color and Temperature Scanner), with firm plans for launch of SeaWiFS in 1997, MODIS (Moderate-Resolution Imaging Spectroradiometer) in 1998 and GLI (Global Imager) in 1999. Sea surface temperature (SST) is available from NOAA polar orbiting satellites and from OCTS. Ocean wind products are derived from ERS-1, ERS-2 and NSCAT (NASA Scatterometer), all of which are presently operating, and ocean topography is measured by ERS-1, ERS-2 and TOPEX/Poseidon (Ocean Topography Experiment).

Ocean color scanners are the only space instruments designed specifically to measure ocean properties directly related to biological and biogeochemical distributions and processes. However, mathematical models and analyses of biological and biogeochemical processes assimilating satellite data of all types, as well as *in situ* data, help quantify relations between biological and physical processes at spatial scales ranging from kilometers to ocean basin and temporal scales from days to interannual and longer. Such relations may be important for developing predictions of ocean climate change on biological and biogeochemical processes and distributions.

In 1996, NASA released the Sensor Intercomparison and Merger for Biological and Interdisciplinary Oceanic Studies (SIMBIOS) NRA (NRA-96-MTPE-04, selection in early 1997) for research to help generate a calibrated long-term ocean radiance and derived product time series using data from various international ocean color missions launched or scheduled for launch between 1996 and 2001. Time series of SIMBIOS data products will provide an unprecedented opportunity to study seasonal to interannual changes in ocean radiance and derived products such as chlorophyll a, colored dissolved organic matter (CDOM), water clarity, primary production and other parameters important to understanding biological and biogeochemical processes.

Programs of other US federal agencies are relevant to the proposals solicited by this NRA, which seeks to complement existing US programs. NOAA's Coastal Ocean Program, National Environmental Satellite, Data and Information Service (NESDIS) and the Coastal Service Center initiated satellite remote sensing projects in 1996 many of which are focused on ocean color algorithm development for US coastal waters. The Environmental Optics Program of the Office of Naval Research also supports research which, as a priority, seeks to quantify optical and bio-optical properties of coastal waters.

A joint National Science Foundation (NSF) and NASA research announcement is under development (for release in February or March, 1997) to solicit proposals for the Joint Global Ocean Flux (JGOFS) Synthesis and Modeling Project (SMP). This joint announcement will include a call for proposals for those interested in using remote sensing data and models to study ocean basin to global scale ocean carbon fluxes, including global primary production and exchanges of carbon dioxide between the ocean and atmosphere.

3.0 Program Objectives

Within the general guidelines presented in Section 1, proposals are sought in (but not limited to) the areas summarized below (and with additional details in Section 4). NASA believes that timing is ideal to integrate measurements from multiple ocean remote sensing instruments such as OCTS (and SeaWiFS), Advanced Very High-Resolution Radiometer (AVHRR)-SST, Ocean Topography Experiment (TOPEX-Poseidon) and NSCAT to study coupling of biological and physical processes related to, for example, topic areas as summarized under sections 3.1.1 and 3.1.3.

3.1 Primary Objectives:

3.1.1. Understand biological variability of major coastal and open ocean ecosystems at seasonal to interannual time scales, their responses to changes in physical climate, and the resulting effects on productivity, including interannual and longer term changes in abundance of commercially important fish stocks.

3.1.2. Develop and apply new methods, algorithms, techniques and approaches to improve the accuracy and utilization of data products derived from current and future satellite ocean color missions, including hyperspectral imagers. Develop new scientific applications for, or better interpretation of, satellite ocean color scanner imagery.

3.1.3. Quantify the impact of changes in ocean ecosystem productivity on ocean transparency and the impact of water composition and transparency on upper ocean heat flux and dynamics.

3.2 Secondary Objectives

3.2.1. Quantify the role of ocean ecosystems in the budgets of biogenic organic and inorganic trace species (including CO and methyl halides) that have major effects on tropospheric ozone, in particular methyl bromide.

3.2.2. Study ocean biological and biogeochemical processes using aircraft remote sensing within geographical or topical areas not suitable or possible, at present, for satellite observation.

4.0 Explanation of, and Additional Information on, Objectives

One of the important new data sources is Local Area Coverage (LAC), full spatial resolution OCTS ocean color and temperature imagery produced under a cooperative program ("Intensive LAC" or "I-LAC") between NASA/NOAA, NASDA and ESA. Under the I-LAC program, NASA and NOAA will generate a scientific-quality time series of OCTS LAC imagery covering North American (including Alaskan) and Hawaiian coastal waters extending out approximately 1000 km from the coast. NASA/NOAA and NASDA will cooperate to produce a similar image time series for the Eastern Tropical Pacific. NASDA will cover the Western Pacific rim and ESA will cover European waters. In addition, global SeaWiFS and OCTS imagery at reduced spatial resolution will be available from the NASA/Goddard Distributed Active Archive Center (GSFC DAAC) and NASDA and respectively. US investigators will have access to all of this imagery for research purposes. See OCTS and SeaWiFS homepages

and the MTPE EOS Reference Handbook (1995) for additional information and references regarding these missions and their data products.

The OCTS time series for US coastal waters started on 13 November, 1996 and the SeaWiFS time series is anticipated to begin during the second half of 1997, assuming a successful SeaWiFS launch in the first half of 1997. For US coastal waters, Level 2 OCTS LAC imagery will be available from the GSFC DAAC or other archive. Level 1 SeaWiFS LAC imagery for US coastal waters will also be available from the GSFC DAAC. Proposers are responsible for finding their own sources of SeaWiFS Level 1 LAC imagery for ocean areas other than US coastal waters or of OCTS LAC imagery for areas outside the I-LAC regions described above.

NASA is also seeking investigators willing to process Level 2 OCTS LAC imagery, and SeaWiFS Level 1 LAC imagery, for US coastal waters into Level 3 products, and make the resultant products available to other approved investigators on request.

Proposers should refer to the SeaWiFS "Requests for Research Use of Ocean Color Data" solicitation (as updated on 17 April, 1996, and available from the SeaWiFS homepage) for procedures to become an approved user of SeaWiFS imagery or to directly receive encrypted data broadcast from the SeaStar satellite as it passes overhead.

Proposals responding to objective 3.1.2 should clearly demonstrate the uniqueness of their approach and how it will lead to improvements in the application or interpretation of satellite ocean color imagery. Priority is to develop tools for regional resource management and for algorithm research directed toward understanding coastal waters, stressed benthic ecosystems such as coral reefs and turbid atmospheres.

For objective 3.2.1, models are an important integrative tool for using global measurements of atmospheric trace constituent composition and measurements of surface biogeochemical processes. Priority is for research leading to the development of models that combine fluxes across the air/sea interface with ocean biological processes resulting in the production and destruction of methyl bromide.

For objective 3.2.2, previous NASA-supported aircraft remote sensing studies involved NASA's Airborne Oceanographic Lidar (AOL) and Airborne Visible and Infrared Imaging Spectrometer (AVIRIS). These sensors have been previously used over estuarine, coastal and open ocean waters to determine spatial patterns of ocean radiance, chlorophyll fluorescence and other in-water constituents.

5.0 SeaWiFS Science Team

For the re-formed team, NASA is seeking a balance between PIs who are working on algorithm development, calibration/validation activities, product generation, and scientific applications. Proposers may respond to this NRA without requesting membership on the SeaWiFS Science Team. Proposers not requesting funds (including those from entities located outside the US) may propose membership on the SeaWiFS Science Team by including only the information requested under 5.1 and 5.2 as the *Project Description* of their proposal (not to exceed 5 pages). For those submitting full proposals requesting funds, the information requested in 5.1 and 5.2 may be included as an appendix.

5.1. If you (and your Co.-PIs) served on the original SeaWiFS Science Team, summarize your specific contributions to team activities including contributions to algorithm development, definition of sensor specifications and mission requirements, collection of validation and calibration data sets (and provided to SeaWiFS project), contributions to SeaWiFS Technical Report Series, algorithm meetings and workshops hosted or attended, and other related activities and contributions.

5.2 What do you (and your Co.-PIs) expect to contribute to the new SeaWiFS Science Team? State your expected contributions to algorithm development, scientific direction,

collection of validation and calibration data sets (and intent to provide these results to SeaWiFS project), contributions to SeaWiFS Technical Report Series, and other related activities.

6.0 References

Mission to Planet Earth Science Research Plan. V1. September, 1996. Office of Mission to Planet Earth, NASA, Washington, DC, 20546

MTPE EOS Reference Handbook. 1995. EOS Project Science Office. Code 900. NASA/Goddard Space Flight Center, Greenbelt, MD 20771.

On-line Information for:

AOL: http://aol.wff.nasa.gov/
AVIRIS: http://info.man.ac.uk/Arts/geography/rs/aviris.html
GSFC DAAC: http://daac.gsfc.nasa.gov/CAMPAIGN_DOCS/
OCDST/OB_main.html
ERS: http://www.esoc.esa.de/external/mso/ers.html
GLI: http://hdsn.eoc.nasda.go.jp/guide/homepage.html
I-LAC: http://www.eorc.nasda.go.jp/ADEOS/
MODIS: http://ltpwww.gsfc.nasa.gov/MODIS/MODIS.html
MOS: http://dv.ba.dlr.de/ne/ws/ws5/mos.html
MTPE Research Announcements:
http://venus.hq.nasa.gov/office/mtpe/nra.html
NSCAT: http://www.jpl.nasa.gov/winds/index.html
OCTS: http://www.eorc.nasda.go.jp/ADEOS/
POLDER: http://www-projet.cst.cnes.fr:8060/polder/Mission2.html
SEAWiFS: http://seawifs.gsfc.nasa.gov/SEAWIFS.html
TOPEX: http://topex-www.jpl.nasa.gov/

7.0 Instructions for Proposers Receiving Prior NASA Support During the past Five Years

If the PI(s) or Co.-PI(s) have received NASA funding in the past five years, information on the prior awards (grants and contracts) are required. Reviewers will be asked to comment on the quality of the prior work described in this section of the proposal. A PI with prior support may use up to five pages (attached as appendix) for each award to describe the results.

The following information should be provided:

a. NASA award number, amount and period of support;

b. title of the project;

c. summary of the results, including, for a research project, any contribution to the development of human resources at the postdoctoral, graduate and undergraduate levels. This may involve, but is not limited to, the role of research in student training, course preparation and seminars (particularly for undergraduates). Special accomplishments in the development of professional scientists and engineers from underrepresented groups should be described. Graduate students who participated in the research should be identified by name. The requirement to submit information regarding the development of human resources does not apply to government, commercial or other non-profit organizations;

d. publications resulting from the NASA award;

e. brief description of available and other related research products not described elsewhere, including data submitted to NASA archives.

8.0 Proposal Submission and Selection Information and Schedule

All prospective Proposers are strongly encouraged to submit a letter of intent in response to this announcement by 4:30 p.m., e.d.t. on March 4, 1997. This will allow us to alert a peer review staff to adequately cover the proposal review process. This letter of intent is available electronically via the Internet at URL: *http://www.mtpe.hq.nasa.gov/LOI/form.html*. The URL for the Co-Investigator information is: *http://www.mtpe.hq.nasa.gov/LOI/coi.html*. We urge you to use these electronic letter of intent forms unless you do not have access to the Internet. In that case, we will accept a FAX copy sent to 202-554-3024 with the following information:

- PI and Co. PI names and addresses, (including Zip + 4);
- Title of proposal;
- Telephone number;
- Fax number;
- Email address; and
- A brief summary of what you plan to propose (Please limit this to no more than 3000 characters).

The actual proposal must not exceed 20 pages (single space) including figures, tables, references and budget. Additional information such as curriculum vitae, information on prior NASA awards, application to SeaWiFS Science Team and other relevant information may be attached as appendices. All proposals from investigators from the US and other countries will be received and evaluated by NASA. Note that NASA does not fund non-US proposals. Foreign investigators must provide a letter of endorsement and secure their funding from sources in their own countries (see Appendix B). All proposals submitted in response to this Announcement are due 4:30 p.m. e.d.t., on April 4, 1997. Late proposals will not be considered for review and funding, unless it is judged to be in the interest of the US Government (see Appendix A, section 11).

Proposals can describe a research plan of up to 3 years in duration. The awards are expected to range between $50,000 and $200,000 per year, including the costs of any aircraft and ship time for which NASA would be responsible. For projects involving more than one Principal Investigator (i.e. with more than one major component), proposals may be submitted together as a single document with a Project Overview giving background information, project objectives and showing how the individual components fit together. Each Principal Investigator of a multiple component project should attach their own complete proposal describing in detail their specific contribution to the project. Awards to each Principal Investigator (i.e. each major component) of multiple investigator projects are expected to range within the guidelines given above with a total project budget not to exceed $500,000 per year (See Appendix A, Section 10 for additional guidance).

The total amount of funds available to this NRA is approximately $4.5 million per year. A complete proposal schedule is given below:

Letter of intent to propose due .....March 5, 1997

Proposals due to NASA .....April 4, 1997

Announcement of final selections .....June 1, 1997

Appendix A contains the basic guidance needed for preparation of proposals in response to this announcement. Appendix B provides guidance for international participation. Appendix C provides the list of required declarations and the proposal cover sheet.

Identifier: NRA-97-MTPE-01

Submit Letters of Intent and
Proposals to: MTPE Biological Oceanography Announcement
Code Y
400 Virginia Avenue, SW, Suite 700
Washington, DC 20024

For overnight mail delivery purposes only the recipient telephone number is (202) 554-2775.

Copies Required: 10

Obtain Additional
General Information: Dr. James A. Yoder
NASA Headquarters
Code YS, MTPE
Washington, DC 20546
(202) 358-0310
E-Mail: jyoder@hq.nasa.gov

Your interest and cooperation in participating in this opportunity are appreciated.

ORIGINAL SIGNED BY:

W. F. Townsend
Acting Associate Administrator for
Mission to Planet Earth

Enclosures:

Appendix A, “Instructions for Responding to NASA Research Announcements.
Appendix B, “Guidelines for Foreign Participation.”
Appendix C, “Required Declarations and Proposal Cover Sheet”

Appendix A

INSTRUCTIONS FOR RESPONDING TO NASA RESEARCH ANNOUNCEMENTS (JUNE 1995)

1. Foreword

a. These instructions apply to NASA Research Announcements. The "NASA Research Announcement (NRA)" permits competitive selection of research projects in accordance with statute while preserving the traditional concepts and understandings associated with NASA sponsorship of research.

b. These instructions are Appendix I to 1870.203 of the NASA Federal Acquisition Regulation Supplement.

2. Policy

a. Proposals received in response to an NRA will be used only for evaluation purposes. NASA does not allow a proposal, the contents of which are not available without restriction from another source, or any unique ideas submitted in response to an NRA to be used as the basis of a solicitation or in negotiation with other organizations, nor is a pre-award synopsis published for individual proposals.

b. A solicited proposal that results in a NASA award becomes part of the record of that transaction and may be available to the public on specific request; however, information or material that NASA and the awardee mutually agree to be of a privileged nature will be held in confidence to the extent permitted by law, including the Freedom of Information Act.

3. Purpose

These instructions supplement documents identified as "NASA Research Announcements." The NRAs contain programmatic information and certain requirements which apply only to proposals prepared in response to that particular announcement. These instructions contain the general proposal preparation information which applies to responses to all NRAs.

4. Relationship to Award

a. A contract, grant, cooperative agreement, or other agreement may be used to accomplish an effort funded in response to an NRA. NASA will determine the appropriate instrument.

b. Grants are generally used to fund basic research in educational and nonprofit institutions, while research in other private sector organizations is accomplished under contract. Contracts resulting from NRAs are subject to the Federal Acquisition Regulation and the NASA FAR Supplement (NHB 5100.4). Any resultant grants or cooperative agreements will be awarded and administered in accordance with the NASA Grant and Cooperative Agreement Handbook (NHB 5800.1).

5. Conformance to Guidance

a. NASA does not have mandatory forms or formats for preparation of responses to NRAs; however, it is requested that proposals conform to the guidelines in these instructions.

NASA may accept proposals without discussion; hence, proposals should initially be as complete as possible and be submitted on the proposers' most favorable terms.

b. In order to be considered responsive, a submission must, at a minimum, present a specific project within the areas delineated by the NRA; contain sufficient technical and cost information to permit a meaningful evaluation; be signed by an official authorized to legally bind the submitting organization; not merely offer to perform standard services or to just provide computer facilities or services; and not significantly duplicate a more specific current or pending NASA solicitation.

6. NRA-Specific Items

a. Several proposal submission items appear in the NRA itself. These include: the unique NRA identifier; when to submit proposals; where to send proposals; number of copies required; and sources for more information. Items included in these instructions may be supplemented by the NRA.

7. Proposal Contents

a. The following information is needed in all proposals in order to permit consideration in an objective manner. NRAs will generally specify topics for which additional information or greater detail is desirable. Each proposal copy shall contain all submitted material, including a copy of the transmittal letter if it contains substantive information.

b. **Transmittal Letter or Prefatory Material.** (1) The legal name and address of the organization and specific division or campus identification if part of a larger organization;

(2) A brief, scientifically valid project title intelligible to a scientifically literate reader and suitable for use in the public press;

(3) Type of organization: e.g., profit, nonprofit, educational, small business, minority, women-owned, etc.;

(4) Name and telephone number of the principal investigator and business personnel who may be contacted during evaluation or negotiation;

(5) Identification of other organizations that are currently evaluating a proposal for the same efforts;

(6) Identification of the NRA, by number and title, to which the proposal is responding;

(7) Dollar amount requested , desired starting date, and duration of project;

(8) Date of submission; and

(9) Signature of a responsible official or authorized representative of the organization, or any other person authorized to legally bind the organization (unless the signature appears on the proposal itself).

c. **Restriction on Use and Disclosure of Proposal Information**

Information contained in proposals is used for evaluation purposes only. Offerors or quoters should, in order to maximize protection of trade secrets or other information that is confidential or privileged, place the following notice on the title page of the proposal and specify the information subject to the notice by inserting appropriate identification, such as page numbers, in the notice. In any event, information contained in proposals will be protected to the extent permitted by law, but NASA assumes no liability for use and disclosure of information not made subject to the notice.

NOTICE

Restriction on Use and Disclosure of Proposal Information. The information (data) contained in [insert page numbers or other identification] of this proposal constitutes a trade secret and/or information that is commercial or financial and confidential or privileged. It is furnished to the Government in confidence with the understanding that it will not, without permission of the offeror, be used or disclosed other than for evaluation purposes; provided, however, that in the event a contract (or other agreement) is awarded on the basis of this proposal the Government shall have the right to use and disclose this information (data) to the extent provided in the contract (or other agreement). This restriction does not limit the Government's right to use or disclose this information (data) if obtained from another source without restriction.

d. **Abstract.** Include a concise (200-300 word if not otherwise specified in the NRA) abstract describing the objective and the method of approach.

e. **Project Description**. (1) The main body of the proposal shall be a detailed statement of the work to be undertaken and should include objectives and expected significance; relation to the present state of knowledge; and relation to previous work done on the project and to related work in progress elsewhere. The statement should outline the plan of work, including the broad design of experiments to be undertaken and a description of experimental methods and procedures. The project description should address the evaluation factors in these instructions and any specific factors in the NRA. Any substantial collaboration with individuals not referred to in the budget or use of consultants should be described. Subcontracting significant portions of a research project is discouraged.

(2) When it is expected that the effort will require more than one year for completion, the proposal should cover the complete project to the extent that it can be reasonably anticipated. Principal emphasis should, of course, be on the first year of work, and the description should distinguish clearly between the first year's work and work planned for subsequent years.

f. **Management Approach**. For large or complex efforts involving interactions among numerous individuals or other organizations, plans for distribution of responsibilities and arrangements for ensuring a coordinated effort should be described. Intensive working relations with NASA field centers that are not logical inclusions elsewhere in the proposal should be described.

g. **Personnel**. The principal investigator is responsible for supervision of the work and participates in the conduct of the research regardless of whether or not compensated under the award. A short biographical sketch of the principal investigator, a list of principal publications and any exceptional qualifications should be included. Omit social security number and other personal items which do not merit consideration in evaluation of the proposal. Give similar biographical information on other senior professional personnel who will be directly associated with the project. Give the names and titles of any other scientists and technical personnel associated substantially with the project in an advisory capacity. Universities should list the approximate number of students or other assistants, together with information as to their level of academic attainment. Any special industry- university cooperative arrangements should be described.

h. **Facilities and Equipment**. (1) Describe available facilities and major items of equipment especially adapted or suited to the proposed project, and any additional major equipment that will be required. Identify any Government-owned facilities, industrial plant equipment, or special tooling that are proposed for use.

(2) Before requesting a major item of capital equipment, the proposer should determine if sharing or loan of equipment already within the organization is a feasible alternative. Where such arrangements cannot be made, the proposal should so state. The need for items that typically can be used for research and non-research purposes should be explained.

I. **Proposed Costs**. (1) Proposals should contain cost and technical parts in one volume: do not use separate "confidential" salary pages. As applicable, include separate cost estimates for salaries and wages; fringe benefits; equipment; expendable materials and supplies; services;

domestic and foreign travel; ADP expenses; publication or page charges; consultants; subcontracts; other miscellaneous identifiable direct costs; and indirect costs. List salaries and wages in appropriate organizational categories (e.g., principal investigator, other scientific and engineering professionals, graduate students, research assistants, and technicians and other non-professional personnel). Estimate all manpower data in terms of man-months or fractions of full-time.

(2) Explanatory notes should accompany the cost proposal to provide identification and estimated cost of major capital equipment items to be acquired; purpose and estimated number and lengths of trips planned; basis for indirect cost computation (including date of most recent negotiation and cognizant agency); and clarification of other items in the cost proposal that are not self- evident. List estimated expenses as yearly requirements by major work phases. (Standard Form 1411 may be used).

(3) Allowable costs are governed by FAR Part 31 and the NASA FAR Supplement Part 18-31 (and OMB Circulars A-21 for educational institutions and A-122 for nonprofit organizations).

j. **Security**. Proposals should not contain security classified material. If the research requires access to or may generate security classified information, the submitter will be required to comply with Government security regulations.

k. **Current Support**. For other current projects being conducted by the principal investigator, provide title of project, sponsoring agency, and ending date.

l. **Special Matters**. (1) Include any required statements of environmental impact of the research, human subject or animal care provisions, conflict of interest, or on such other topics as may be required by the nature of the effort and current statutes, executive orders, or other current Government-wide guidelines.

(2) Proposers should include a brief description of the organization, its facilities, and previous work experience in the field of the proposal. Identify the cognizant Government audit agency, inspection agency, and administrative contracting officer, when applicable.

8. Renewal Proposals

a. Renewal proposals for existing awards will be considered in the same manner as proposals for new endeavors. A renewal proposal should not repeat all of the information that was in the original proposal. The renewal proposal should refer to its predecessor, update the parts that are no longer current, and indicate what elements of the research are expected to be covered during the period for which support is desired. A description of any significant findings since the most recent progress report should be included. The renewal proposal should treat, in reasonable detail, the plans for the next period, contain a cost estimate, and otherwise adhere to these instructions.

b. NASA may renew an effort either through amendment of an existing contract or by a new award.

9. Length

Unless otherwise specified in the NRA, effort should be made to keep proposals as brief as possible, concentrating on substantive material. Few proposals need exceed 15-20 pages. Necessary detailed information, such as reprints, should be included as attachments. A complete set of attachments is necessary for each copy of the proposal. As proposals are not returned, avoid use of "one-of-a-kind" attachments: their availability may be mentioned in the proposal.

10. Joint Proposals

a. Where multiple organizations are involved, the proposal may be submitted by only one of them. It should clearly describe the role to be played by the other organizations and indicate the legal and managerial arrangements contemplated. In other instances, simultaneous submission of related proposals from each organization might be appropriate, in which case parallel awards would be made.

b. Where a project of a cooperative nature with NASA is contemplated, describe the contributions expected from any participating NASA investigator and agency facilities or equipment which may be required. The proposal must be confined only to that which the proposing organization can commit itself. "Joint" proposals which specify the internal arrangements NASA will actually make are not acceptable as a means of establishing an agency commitment.

11. Late Proposals

A proposal or modification received after the date or dates specified in an NRA may be considered if the selecting official deems it to offer NASA a significant technical advantage or cost reduction.

12. Withdrawal

Proposals may be withdrawn by the proposer at any time. Offerors are requested to notify NASA if the proposal is funded by another organization or of other changed circumstances which dictate termination of evaluation.

13. Evaluation Factors

a. Unless otherwise specified in the NRA, the principal elements (of approximately equal weight) considered in evaluating a proposal are its relevance to NASA's objectives, intrinsic merit, and cost.

b. Evaluation of a proposal's relevance to NASA's objectives includes the consideration of the potential contribution of the effort to NASA's mission.

c. Evaluation of its intrinsic merit includes the consideration of the following factors, none of which is more important than any other:

(1) Overall scientific or technical merit of the proposal or unique and innovative methods, approaches, or concepts demonstrated by the proposal.

(2) Offeror's capabilities, related experience, facilities, techniques, or unique combinations of these which are integral factors for achieving the proposal objectives.

(3) The qualifications, capabilities, and experience of the proposed principal investigator, team leader, or key personnel critical in achieving the proposal objectives.

(4) Overall standing among similar proposals and/or evaluation against the state-of-the-art.

d. Evaluation of the cost of a proposed effort includes the realism and reasonableness of the proposed cost and the relationship of the proposed cost and available funds.

14. Evaluation Techniques

Selection decisions will be made following peer and/or scientific review of the proposals. Several evaluation techniques are regularly used within NASA. In all cases proposals are subject to scientific review by discipline specialists in the area of the proposal. Some proposals are reviewed entirely in-house, others are evaluated by a combination of in-house and selected external reviewers, while yet others are subject to the full external peer review technique (with due regard for conflict-of- interest and protection of proposal information), such as by mail or

through assembled panels. The final decisions are made by a NASA selecting official. A proposal which is scientifically and programmatically meritorious, but not selected for award during its initial review, may be included in subsequent reviews unless the proposer requests otherwise.

15. Selection for Award

a. When a proposal is not selected for award, and the proposer has indicated that the proposal is not to be held over for subsequent reviews, the proposer will be notified. NASA will explain generally why the proposal was not selected. Proposers desiring additional information may contact the selecting official who will arrange a debriefing.

b. When a proposal is selected for award, negotiation and award will be handled by the procurement office in the funding installation. The proposal is used as the basis for negotiation. The contracting officer may request certain business data and may forward a model contract and other information which will be of use during the contract negotiation.

16. Cancellation of NRA

NASA reserves the right to make no awards under this NRA and to cancel this NRA. NASA assumes no liability for canceling the NRA or for anyone's failure to receive actual notice of cancellation. Cancellation may be followed by issuance and synopsis of a revised NRA, since amendment of an NRA is normally not permitted.

Appendix B

GUIDELINES FOR FOREIGN PARTICIPATION

NASA accepts proposals from entities located outside the U.S. in response to this NRA. Proposals from non-U.S. entities should not include a cost plan. Non-U.S. proposals, and U.S. Proposals that include non-U.S. participation, must be endorsed by the respective government agency or funding/sponsoring institution in the country from which the non-U.S. participant is proposing. Such endorsement should indicate the following points: (1) The proposal merits careful consideration by NASA; and (2) If the proposal is selected, sufficient funds will be made available by the sponsoring foreign agency to undertake the activity as proposed.

Proposals, along with the requested number of copies and Letter of Endorsement must be forwarded to NASA in time to arrive before the deadline established for this NRA. In addition, one copy of each of these documents should be sent to:

NASA Headquarters
Office of External Relations
Mission to Planet Earth Division, Code IY
Washington, DC 20546
USA

Any materials sent by courier or express mail should include the street address 300 E Street, S. W., and substitute 20024 for the indicated ZIP code.

All proposals must be typewritten in English. All non-U.S. proposals will undergo the same evaluation and selection process as those originating in the U.S. Non-U.S. proposals and U. S. Proposals that include non-U.S. participation, must follow all other guidelines and requirements described in this NRA. Sponsoring non-U.S. agencies may, in exceptional situations, forward a proposal without endorsement to the above address, if review and endorsement are not possible before the announced closing date. In such cases, however, NASA's Mission to Planet Earth Division of the Office of External Relations should be advised when a decision on the endorsement is to be expected.

Successful and unsuccessful proposers will be contacted directly by the NASA Program Office coordinating the NRA. Copes of these letters will be sent to the sponsoring government agency.

Appendix C

Certification Regarding
Debarment, Suspension, and Other Responsibility Matters
Primary Covered Transactions

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 34 CFR Part 85, Section 85.510, Participant's responsibilities. The regulations were published as Part VII of the May 26, 1988 Federal Register (pages 19160-19211). Copies of the regulation may be obtained by contracting the U.S. Department of Education, Grants and Contracts Service, 400 Maryland Avenue, S.W. (Room 3633 GSA Regional Office Building No. 3), Washington, DC. 20202-4725, telephone (202) 732-2505.

(1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statues or commission of embezzlement theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and

(d) Have not within three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

(2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

_____

Organization Name PR/Award Number or Project Name

_____

Name and Title of Authorized Representative

_____

Signature Date

ED Form GCS-008 (REV.12/88)

Appendix C

Certification Regarding Drug-Free Workplace Requirements
Grantees Other Than Individuals

This certification is required by the regulations implementing the Drug-Free Workplace Act of 1988, 34 CFR Part 85, Subpart F. The regulations, published in the January 31, 1989 Federal Register, require certification by grantees, prior to award, that they will maintain a drug-free workplace. The certification set out below is a material representation of fact upon which reliance will be placed when the agency determines to award the grant. False certification or violation of the certification shall be grounds for suspension of payments, suspension or termination of grants, or governmentwide suspension or debarment (see 34 CFR Part 85, Sections 85.615 and 85.620).

This grantee certifies that it will provide a drug-free workplace by:

(a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;

(b) Establishing a drug-free awareness program to inform employees about -
   (1) The dangers of drug abuse in the workplace;
   (2) The grantee's policy of maintaining a drug-free workplace;
   (3) Any available drug counseling, rehabilitation, and employee assistance programs, and
   (4) The penalties that may be imposed upon employees for drug abuse violations in the workplace;

(c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);

(d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will -

   (1) Abide by the terms of the statement; and
   (2) Notify the employer of any criminal drug statute conviction for a violation occurring in the workplace no later than five days after such conviction;

(e) Notifying the agency within ten days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction;

(f) Taking one of the following actions, within 30 days of receiving notice under subparagraph (d)(2) , with respect to any employee who is so convicted -
   (1) Taking appropriate personnel action against such an employee, up to and including termination; or
   (2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

(g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraph (a), (b), (c), (e), and (f).

_____

Organization Name PR/Award Number or Project Name

_____

Name and Title of Authorized Representative

_____

Signature Date

ED 80-0004

Appendix C

CERTIFICATION REGARDING LOBBYING

Certification for Contracts, Grants, Loans, and Cooperative Agreements.

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000, and not more than $100,000 for each such failure.

_____

Signature and Date

_____

Name and Title of Authorized Representative

_____

Organization Name

Appendix C

Proposal Cover Sheet
NASA Research Announcement 97-MTPE-01

Proposal No. _____ (Leave Blank for NASA Use)

Title: _____

Principal Investigator:

Name: _____

Department:_____

Institution: _____

Street/PO Box: _____

City: _____ State: _____ Zip: _____

Country: _____ E-mail: _____

Telephone: _____ Fax: _____

Co-Investigators:

Name	Institution	Telephone
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Budget:

1st Year: _____ 2nd Year: _____ 3rd Year: _____

Total: _____

Authorizing Official: _____ _____
(Name) (Institution)